

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 3, 19, 21, and 22 have been canceled.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1, 2, 4-17, and 20 are now pending in this application.

Rejections under 35 U.S.C. § 112

Claims 21 and 22 are rejected under 35 U.S.C. § 112, second paragraph, as alleged being indefinite. This rejection is respectfully traversed.

Claims 21 and 22 have been canceled. Claim 1 has been amended to include features similar to claims 21 and 22, namely to recite “wherein a planar air permeability of said stack is more than 0.02 l/min*cm.” The April 2009 amendment removed this feature from claim 1 and placed it in claims 21 and 22. Applicant now re-introduces this feature into claim 1.

The Office argues on pages 2-3 of the Office Action that claims 21 and 22 are indefinite because it is unclear if the impermeable metal structure is intended to be included in the measurement of air permeability or if the air permeability only regards the first and second metal fiber layers.

Applicant notes that amended claim 1 clearly recites that the planar air permeability of the stack is recited in claim 1 and that the components of the stack, including an impermeable metal structure, are recited in claim 1. In addition, Applicant respectfully submits that one of ordinary skill in the art would understand the meaning of the language of amended claim 1 and the metes and bounds of amended claim 1 and know how to ascertain the planar air

permeability of a stack. For example, one of ordinary skill in the art would understand the meaning of “planar air permeability” in light of the disclosure of Applicant’s application, such as page 3, line 29, to page 4, line 17, of Applicant’s specification, which discusses planar air permeability.

For at least the reasons discussed above, reconsideration and withdrawal of this rejection is respectfully requested.

Rejection under 35 U.S.C. § 103

Claims 1-17 and 19-22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,554,225 to Sounai *et al.* (hereafter “Sounai”) in view of U.S. Patent No. 6,562,507 to Cisar *et al.* (hereafter “Cisar”). This rejection is respectfully traversed.

Sounai discloses a molten carbonate fuel cell with a cathode 14, an anode 15, and an electrolyte layer 13. See Sounai at col. 4, lines 19-30. Each of the cathode 14 and anode 15 include a first porous layer 18 formed at a side of the electrolyte layer 13 and a second porous layer 19 formed at the opposite side. See Sounai at col. 4, lines 36-42, and Figure 2. Sounai discloses that the first porous layer 18 and the second porous layer 19 have a porosity of 60-80%. See Sounai at col. 4, lines 42-52.

However, as suggested on page 4 of the Office Action, Sounai does not disclose or suggest layers being sintered to one another, as recited in claim 1.

In addition, Sounai does not disclose or suggest a stack comprising, among other things, an impermeable metal structure, at least one first metal layer, and at least one second metal fiber layer, wherein a porosity of said second metal layer is less than 80%, wherein a porosity of said first metal fiber layer is more than 80%, as recited in claim 1. Claims 2-17, 19, and 20 depend from claim 1.

The Office notes that Sounai discloses the porosity of the first and second porous layers 18, 19 to be 60-80% and argues on page 5 of the Office Action that this range overlaps the porosity range of the first metal fiber layer, which is more than 80%. Applicant respectfully disagrees because a porosity of more than 80%, as recited in claim 1, does not

overlap with the range of 60-80% disclosed by Sounai. A value of 80%, the endpoint of the porosity range disclosed by Sounai, is less than a range of more than 80%, as recited in claim 1 for the porosity of the first metal fiber layer, and does not overlap with this range. Therefore, Sounai does not disclose or suggest the porosity of the first metal fiber layer recited in claim 1.

Cisar discloses a barrier and flow control device for electrochemical reactors that includes a flow field 102, a thin porous gas diffusion layer 104 sintered to the flow field 102, a membrane 106, and electrodes 108, 109. See col. 9, lines 1-13, 37-47, and Figures 13 and 15 of Cisar. Cisar discloses that flow field can have a structure of metal foam, metal grids, sintered metal particles, sintered metal fibers, and combinations thereof. See claim 2 of Cisar.

However, Cisar does not remedy the deficiencies of Sounai because Cisar does not disclose or suggest a stack comprising, among other things, an impermeable metal structure, at least one first metal layer, and at least one second metal fiber layer, wherein a porosity of said second metal layer is less than 80%, wherein a porosity of said first metal fiber layer is more than 80%, as recited in claim 1.

In addition, as suggested on page 5 of the Office Action, the combination of Sounai and Cisar does not disclose or suggest the planar air permeability of claim 1. The Office argues on page 5 of the Office Action that the stack of Sounai and Cisar would have the planar air permeability of claim 1 because air permeability is directly related to porosity.

However, as noted above, Sounai and Cisar do not disclose or suggest a stack having, among other things, at least a first metal fiber layer having a porosity of more than 80%, as recited in claim 1.

In addition, the technical reasoning provided by the Office to support the Office's argument, i.e., that porosity and air permeability are directly related, is not always true. As shown in the enclosed Exhibit A, a top stack of layers having a relatively low porosity (as demonstrated by the white areas) would have a larger planar air permeability than the bottom stack of layers, which has a relatively larger porosity, due to the structures of these stacks.

Therefore, simply because a stack has a given porosity does not necessarily mean that the stack will have a corresponding planar air permeability, as argued by the Office, because there are other factors to consider. As noted by the Office on page 5 of the Office Action, the inherency of a claimed features may not be established by probabilities or possibilities. See MPEP § 2112, Part IV, *citing In re Robertson*, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). The probability or possibility that a disclosed porosity providing a claimed planar air permeability does not adequately provide the inherency of the claimed planar air permeability, particularly when there are other contributing factors to consider.

Furthermore, the combination of Sounai and Cisar does not disclose or suggest a stack comprising, among other things, an impermeable metal structure, at least one first metal layer, and at least one second metal fiber layer, said first metal fiber layer being sintered to a first side of said impermeable metal structure, said second metal fiber layer being sintered to another side of said first metal fiber layer opposite to the impermeable metal structure, wherein a porosity of said second metal layer is less than 80%, wherein a porosity of said first metal fiber layer is more than 80%, as recited in claim 1.

Sounai discloses that the pore size of the first porous layer 18 is set to allow capillary action and that the pore size of the second porous layer 19 is set to not allow the capillary action, with the first porous layer 18 having a small pore size and the second porous layer 19 having a large pore size. See Sounai at col. 5, lines 25-29, 41-46, and Figure 2. Thus, the order of the first and second layers 18, 19 of Sounai is opposite to the order of the stack recited in claim 1, as shown in the example of the enclosed Exhibit B, in which the layer with the greatest porosity is sintered to a side of an impermeable metal structure, as recited in claim 1. Cisar fails to remedy these deficiencies of Sounai.

For at least the reasons discussed above, the combination of Sounai and Cisar does not disclose or suggest all of the features of claim 1. Reconsideration and withdrawal of this rejection is respectfully requested.

Conclusion

Applicant submits that the present application is now in condition for allowance.

Favorable reconsideration of the application as amended is respectfully requested.


The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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